



**The 2008 Massachusetts
Smart Growth / Smart Energy
Conference**

**Afternoon Workshops
Section C**

**(3:00 PM – 4:00 PM)
*Session C-7***

**The Parking
Predicament:**

**Demand Management
While the Pressure's Off**



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Presentation Outline

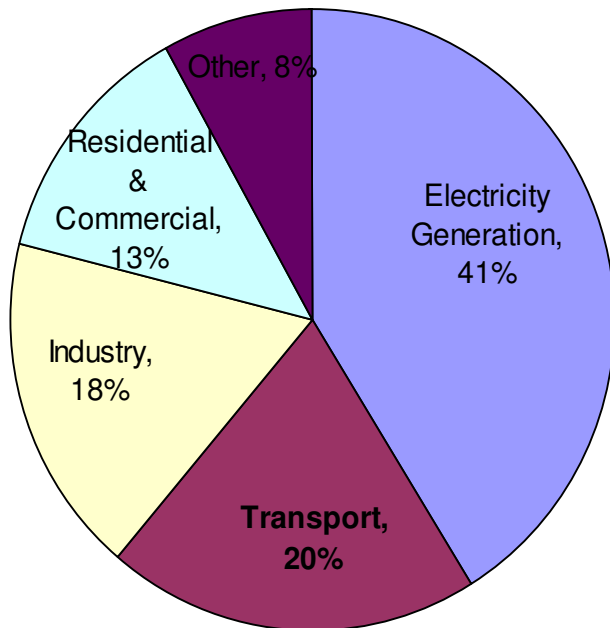
1. Why is parking so important?
2. What we've been doing wrong for 85 years
3. Mismanaging supply
4. Controlling demand
5. Why TOD works



Transportation and Climate Change

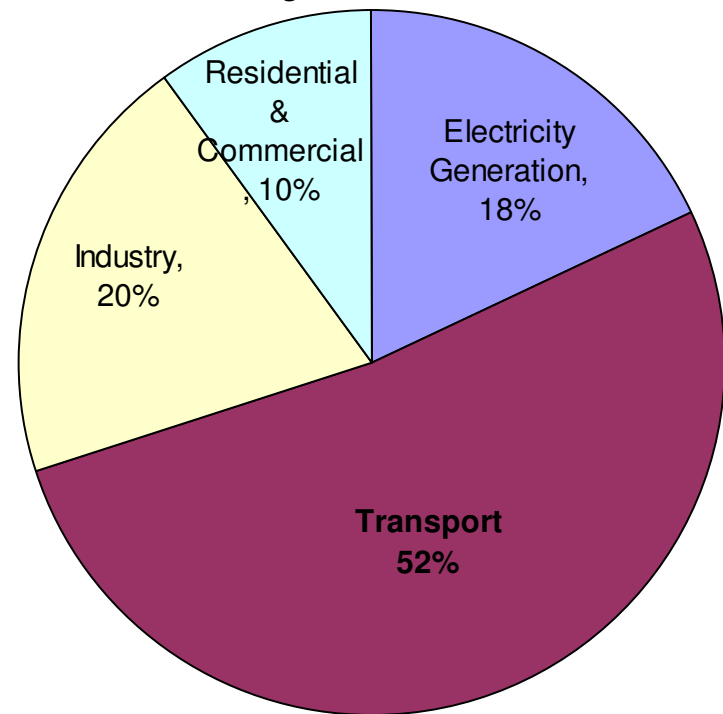
Transport sector produces substantial share of CO₂ emissions in U.S.

Global Carbon Dioxide Emissions from Fossil Fuel Burning by Sector, 2004



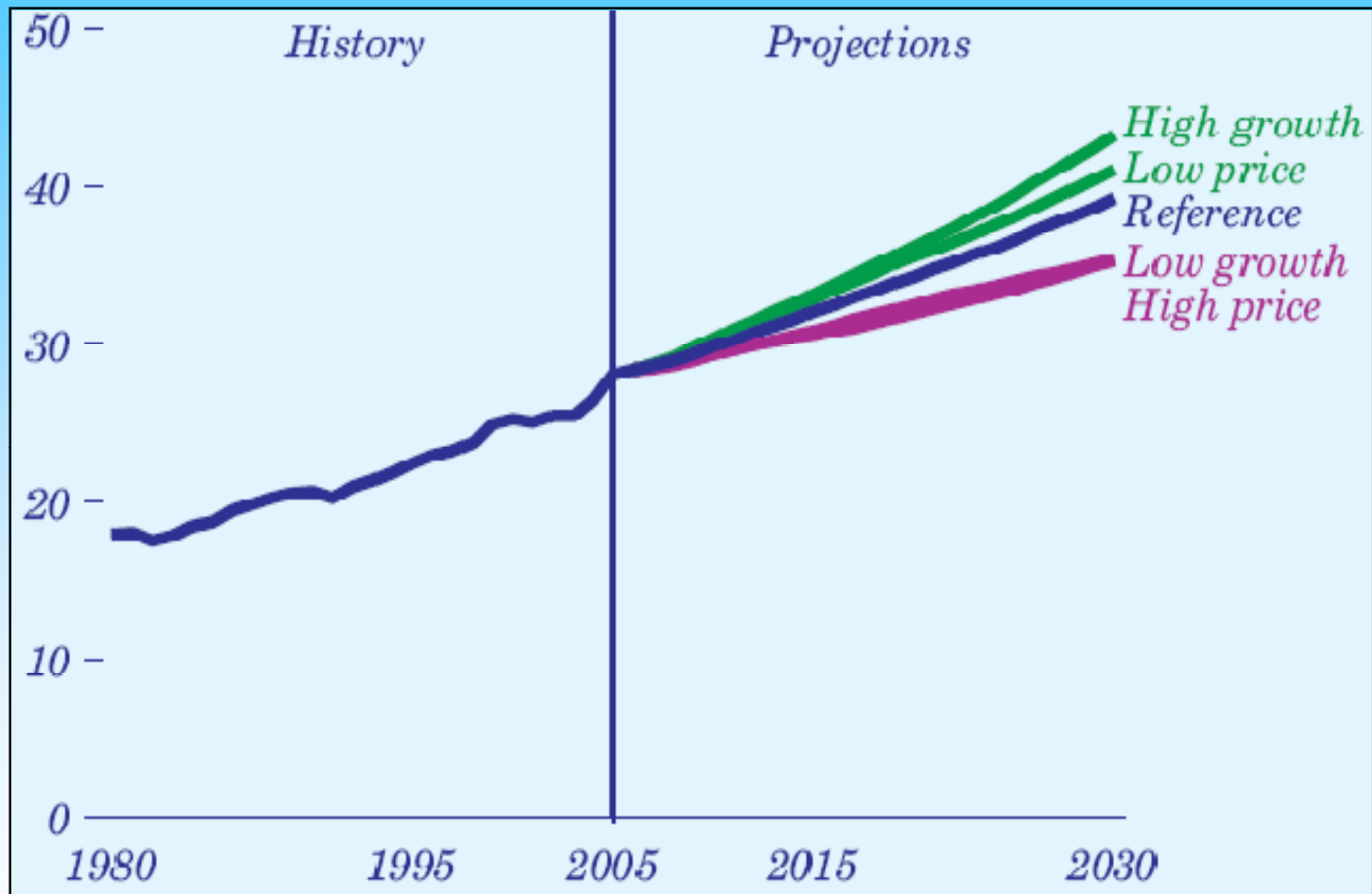
Source: Earth Policy Institute

Carbon Dioxide Emissions from Fossil Fuels in Washington State, USA, 2007



Source: Sightline Institute

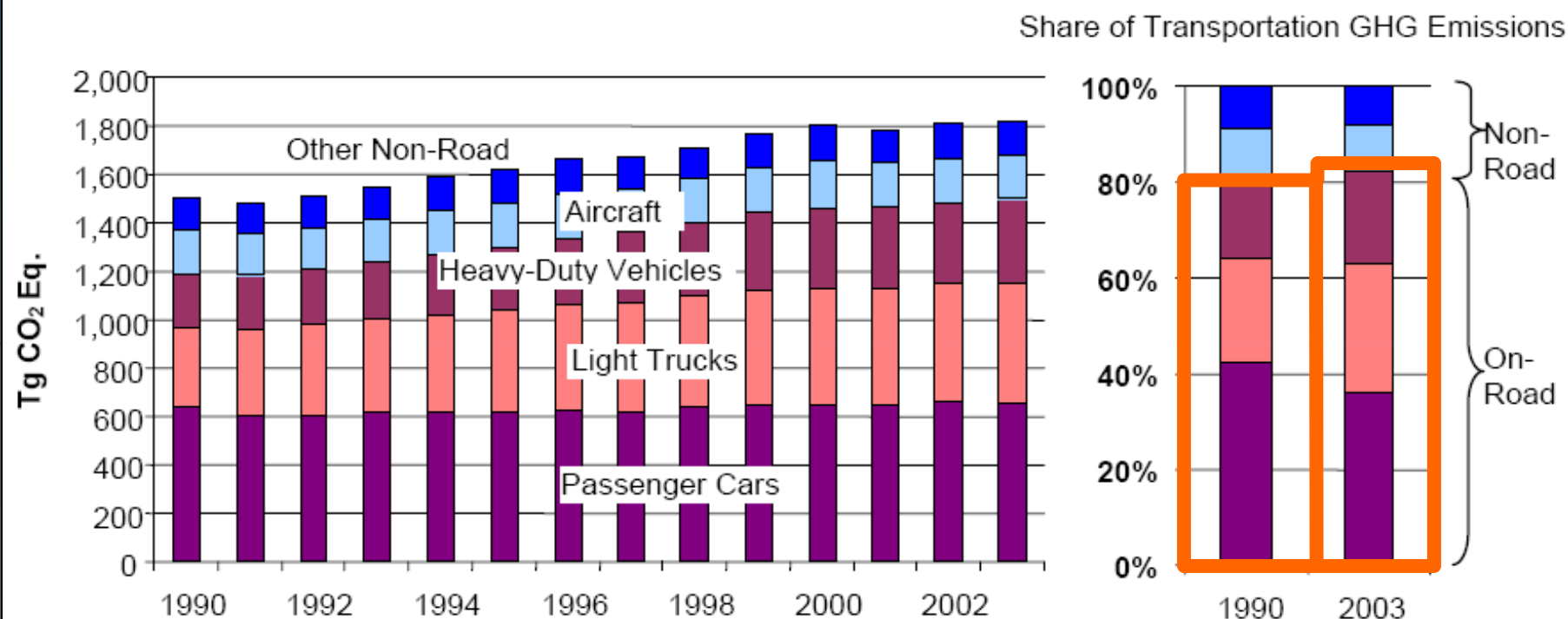
Transportation emissions are expected to increase



Transportation energy consumption, 1980-2030 (quadrillion Btu)

Most transport emissions come from driving...

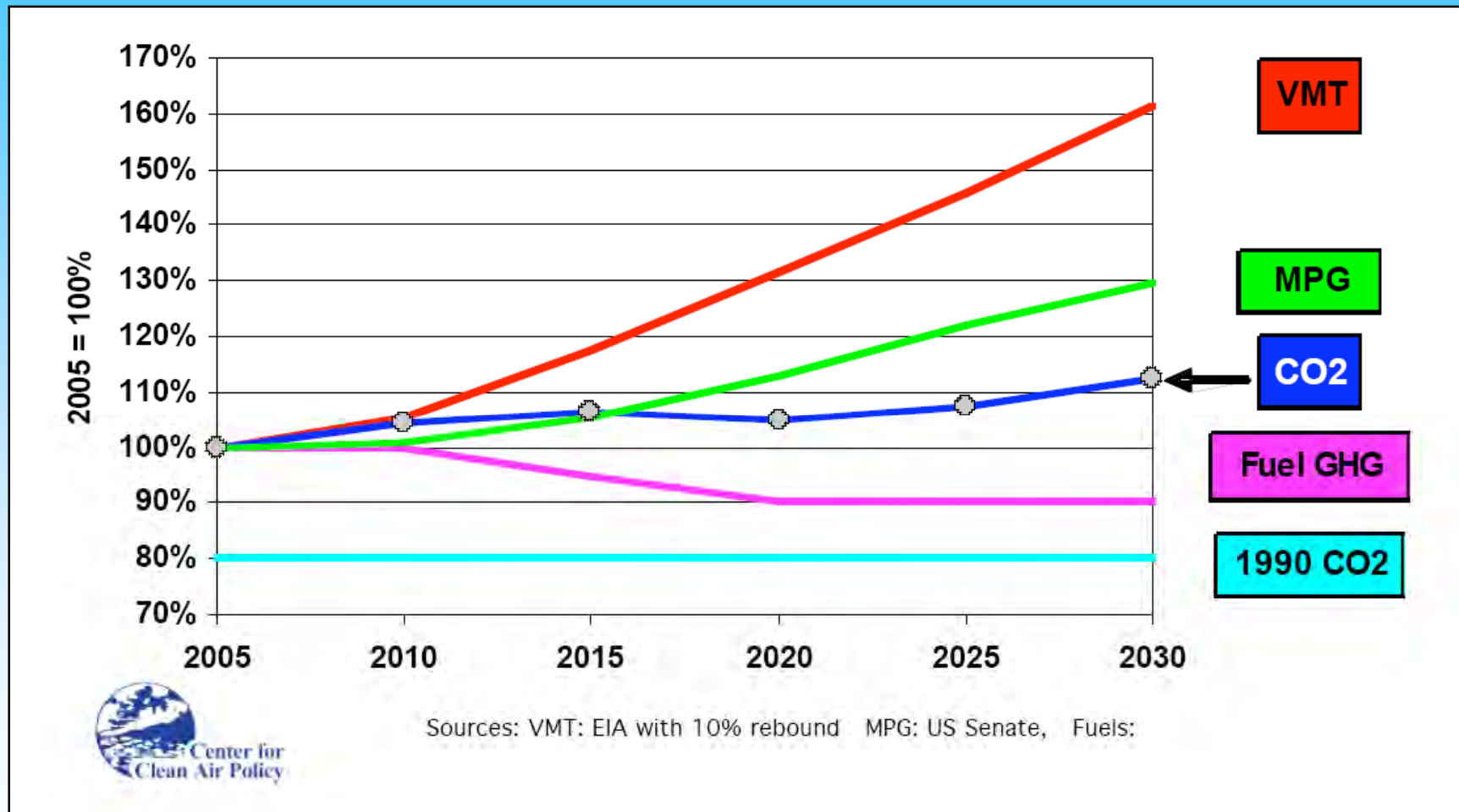
Figure 2-3. GHG Emissions by Modes of Transportation,^a 1990–2003



Source: U.S. Environmental Protection Agency, 2005. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2003*. Washington, DC, Table 2-9.

Source: "Greenhouse Gas Emissions from the US Transportation Sector," USEPA 2006.

Improved Fuel Economy and Biofuels are not enough

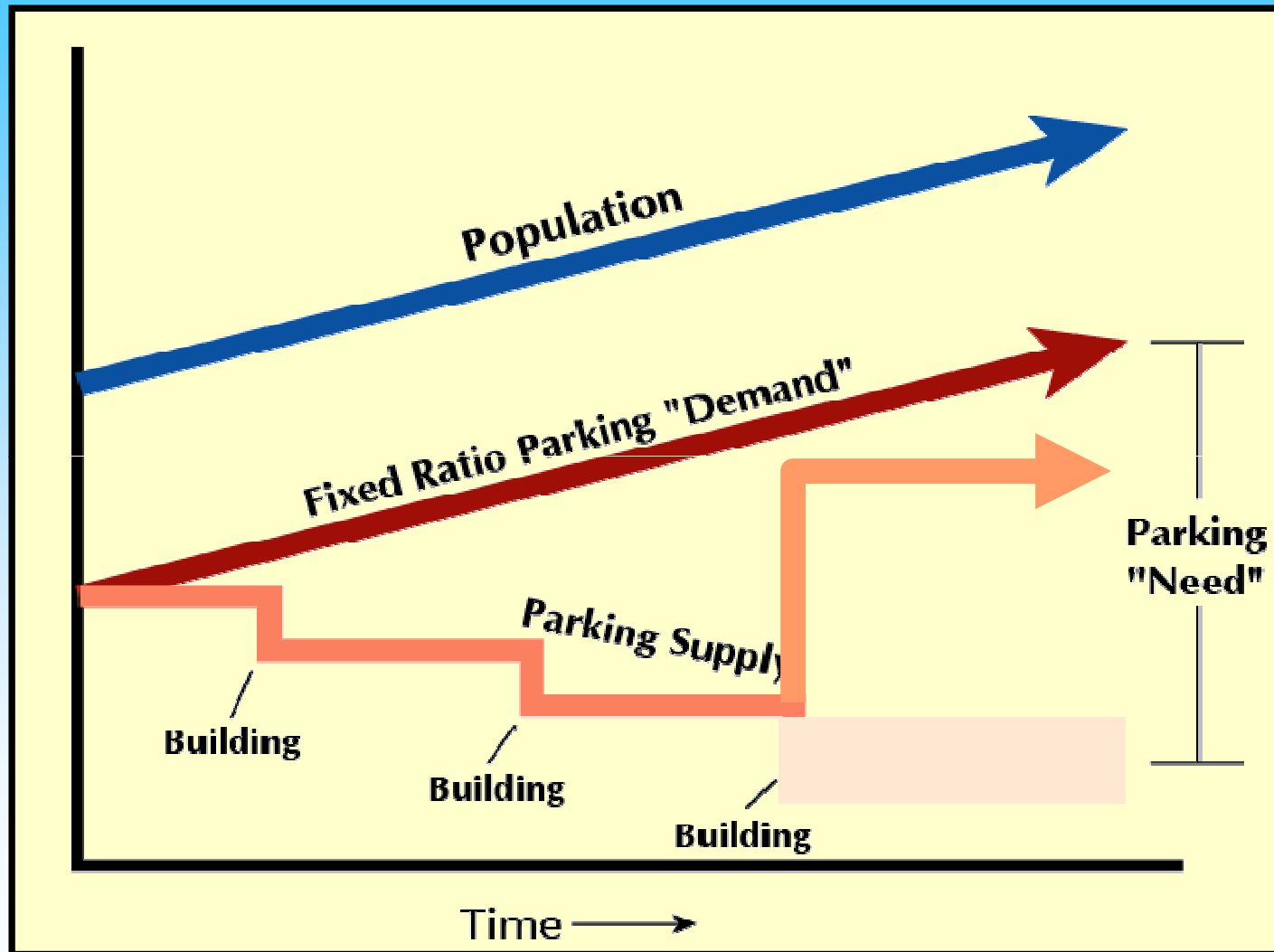


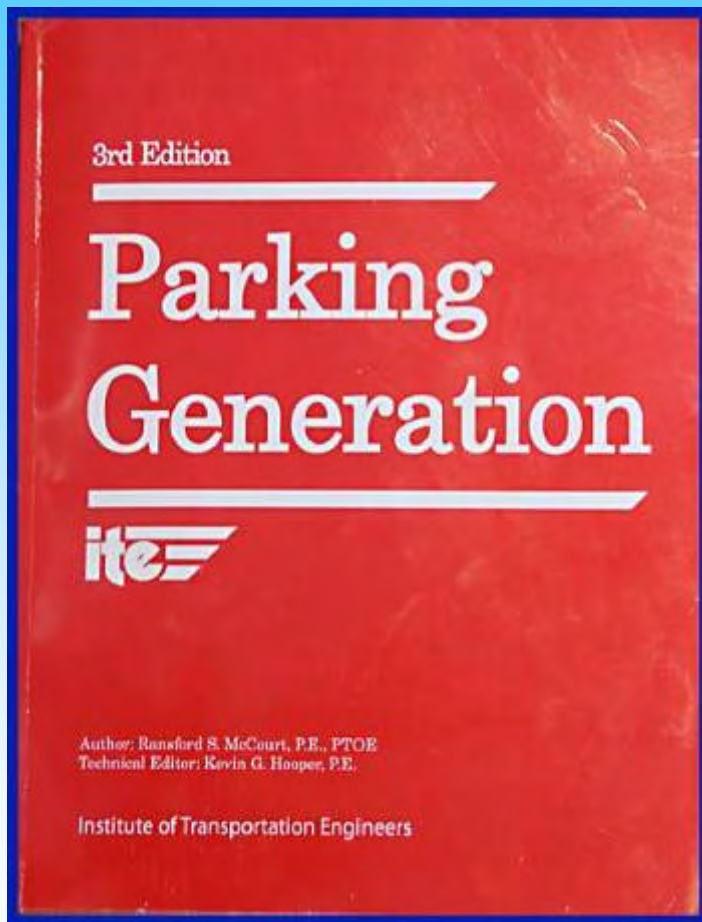
Analysis by Steve Winkelman, Center for Clean Air Policy, Using US DOE data in Ewing, Reid, "Growing Cooler: The Evidence on Urban Development and Climate Change," (ULI)

Climate change requires a mode shift strategy



Problems With “Supply Side” Solutions





FAST FOOD RESTAURANT WITH DRIVE-IN WINDOW (836)

Peak Parking Spaces Occupied vs: 1,000 GROSS SQUARE FEET
LEASABLE AREA

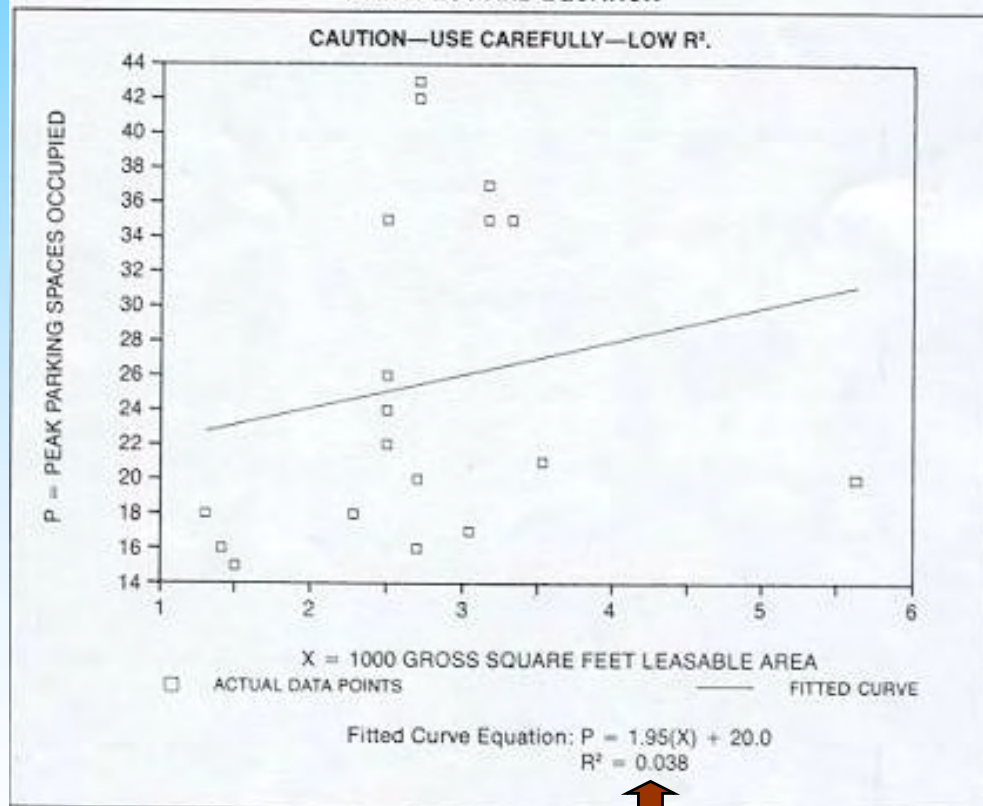
On a: WEEKDAY

PARKING GENERATION RATES

Average Rate	Range of Rates	Standard Deviation	Number of Studies	Average 1,000 GSF Leasable Area
9.95	3.55-15.92	3.41	18	3



DATA PLOT AND EQUATION



Minimum Parking Requirements - Source



Example: Office Parks

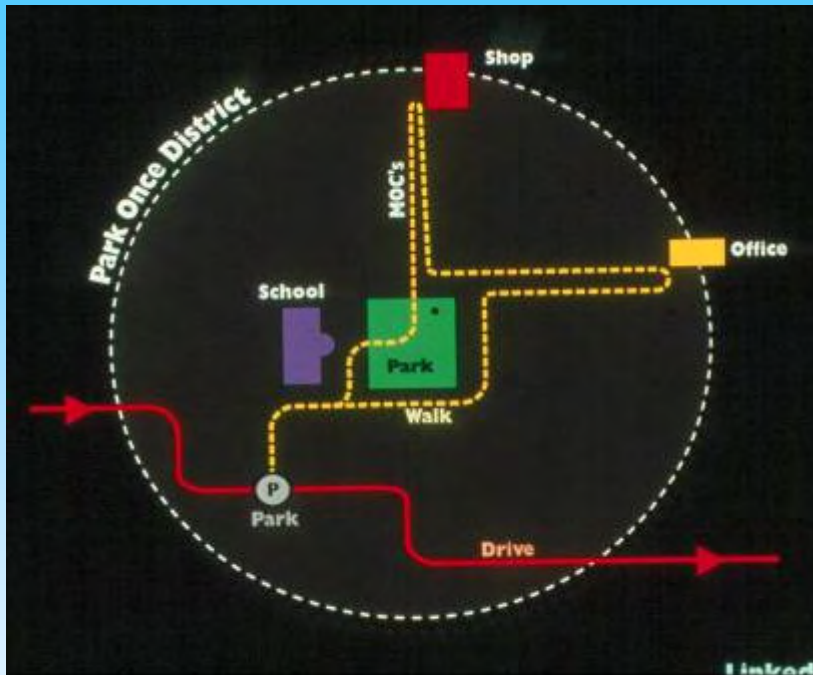
Peak Occupancy Rates, in spaces per 1000 sf of building area:

Lowest:	0.94 spaces
Average:	2.52 spaces
Highest:	4.25 spaces

Typical requirement:
4.0 spaces/1000 sf

Source: ITE's Parking Generation (2nd ed., 1987)

Demand vs. Requirement: Downtown Palo Alto



Observed peak occupancy:

- 1.91 spaces per 1,000 s.f.

Peak occupancy w/ 10% vacancy:

- 2.1 spaces per 1,000 s.f.

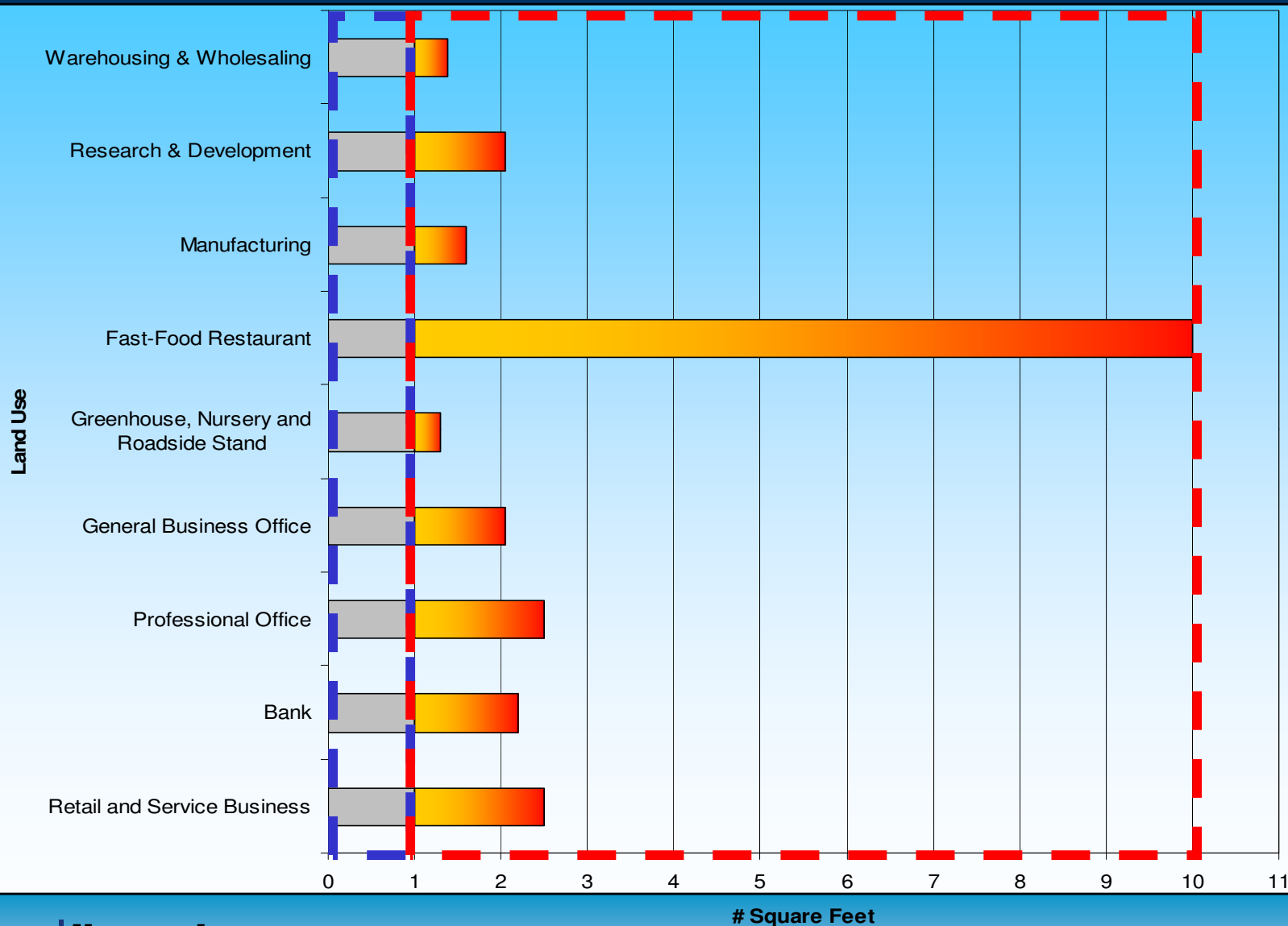
Existing Requirement:

- 4 spaces per 1,000 s.f.
- Would require 5,210 more spaces than observed demand to bring downtown to 4 spaces per 1,000 sf requirement
- At \$51K/space = \$298 million

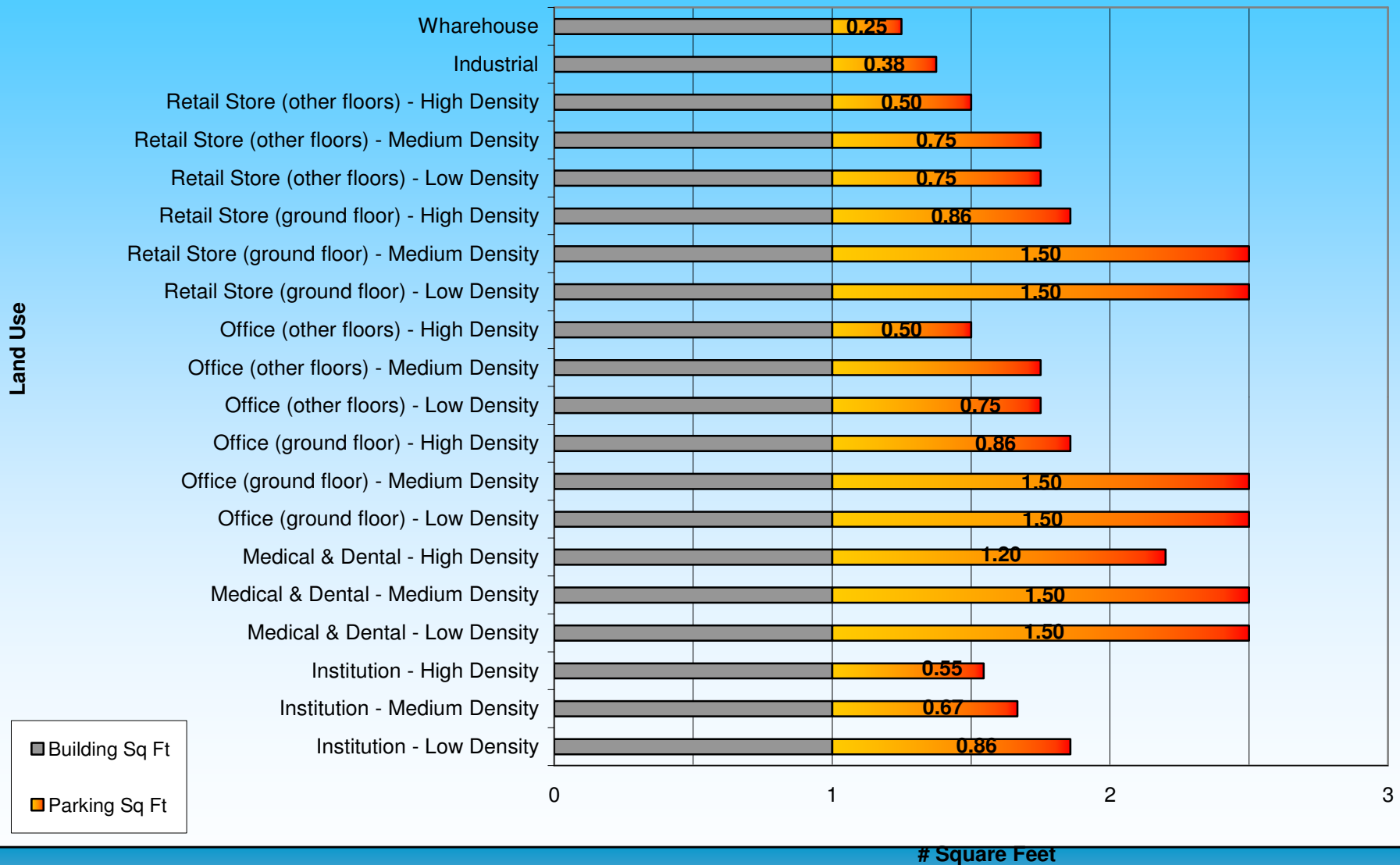
Parking Demand in Four Main St. Districts

City	City Pop.	Mode Split (Employee Commuting)							Occupied Parking Spaces per 1,000 sf (non-res)
		<i>Drove Alone</i>	<i>2 or More Person Carpool</i>	<i>Transit</i>	<i>Bicycle</i>	<i>Walked</i>	<i>Other Means</i>	<i>Worked at Home</i>	
Chico	59,900	61%	12%	1%	11%	13%	1%	1%	1.7
Palo Alto	58,600	80%	9%	4%	3%	3%	1%	0%	1.9
Santa Monica	84,100	74%	11%	11%	1%	2%	1%	0%	1.8
Kirkland, WA	45,600	77%	12%	4%	0%	2%	1%	4%	1.6

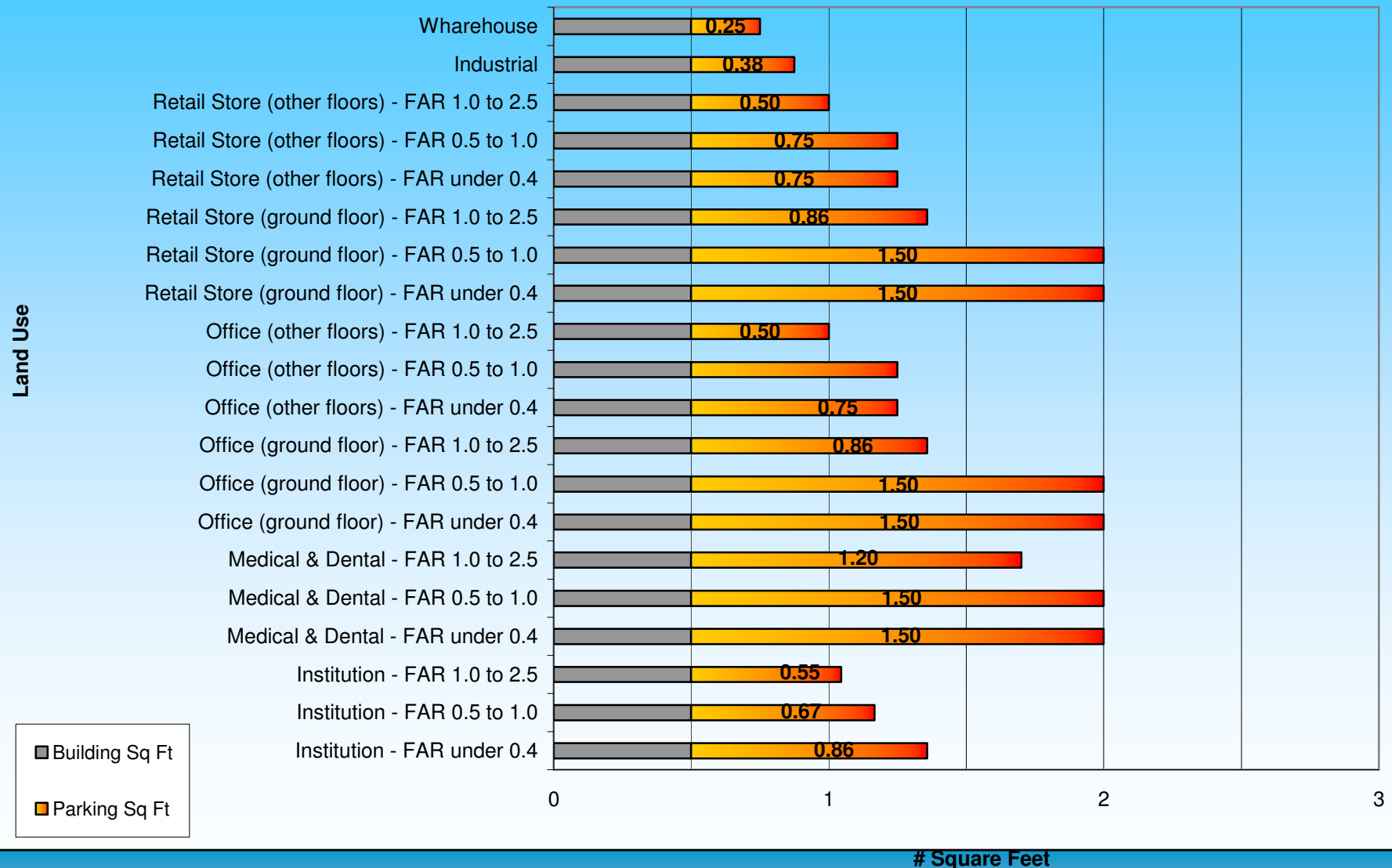
Current Parking Requirements: Hingham



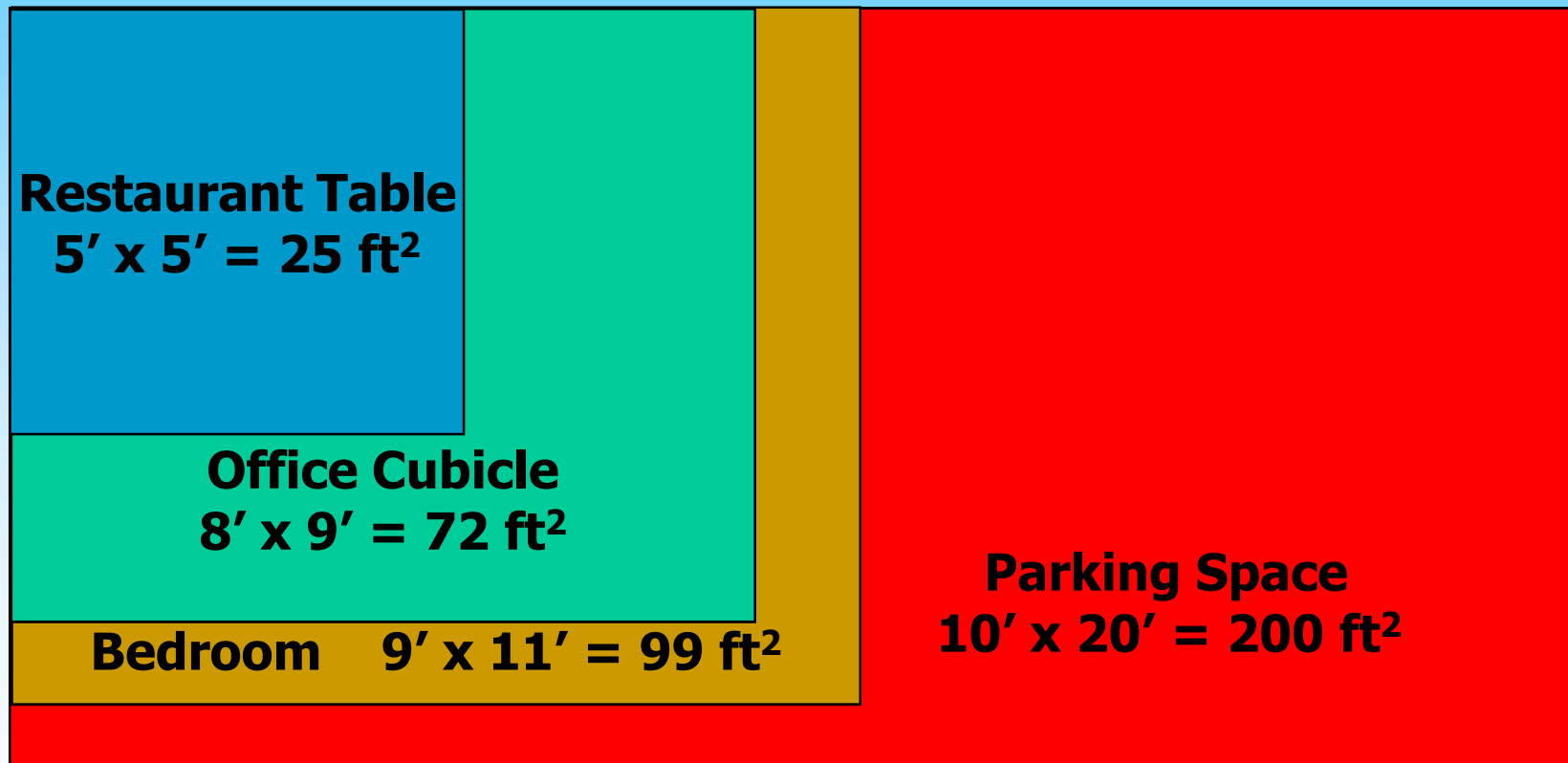
Brookline



Brookline



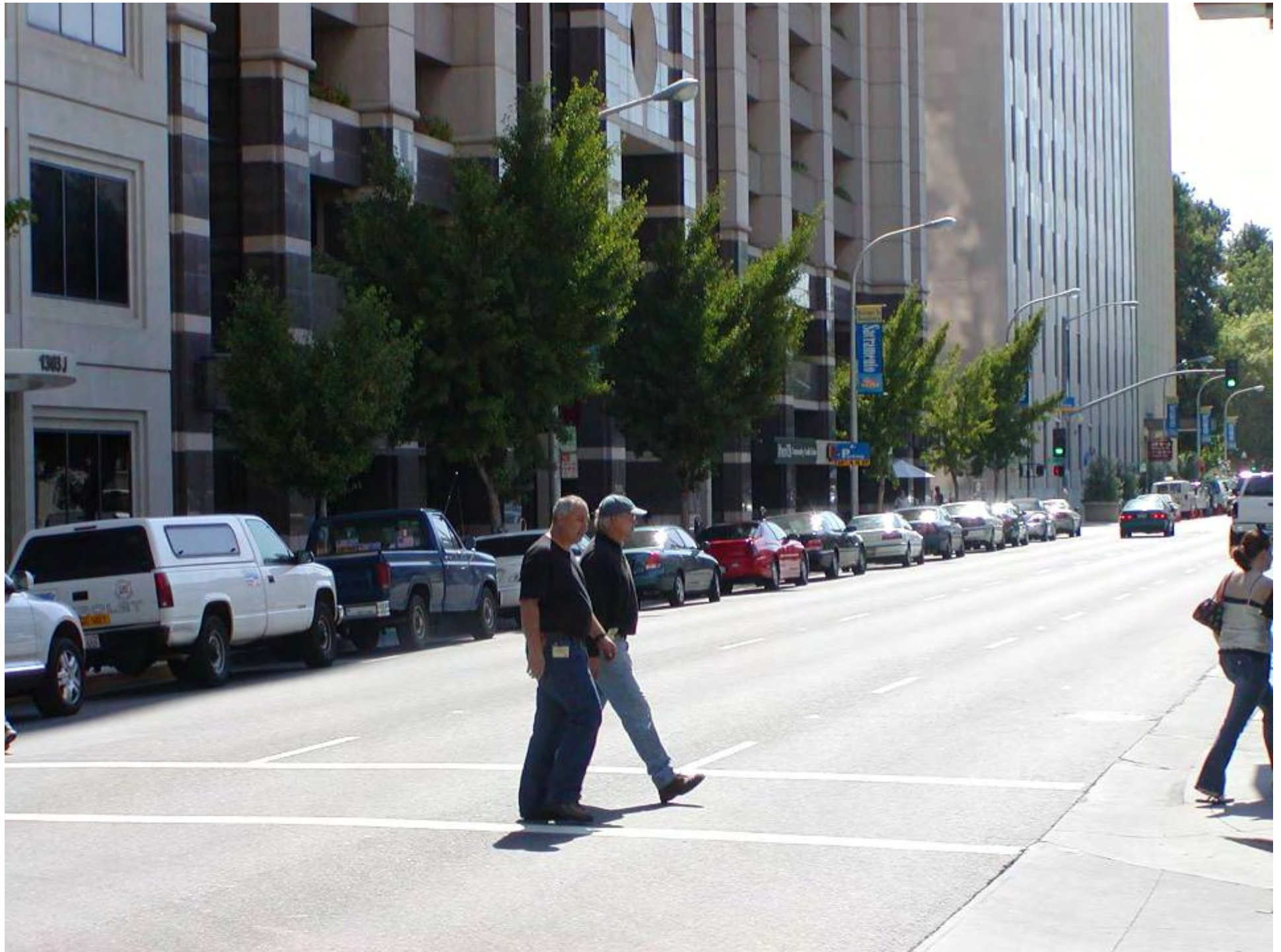
What Land Value Are We Losing?















DOWNTOWN PARKING OCCUPANCY

Main Street - free



**Parking structures -
\$1.50/hour**

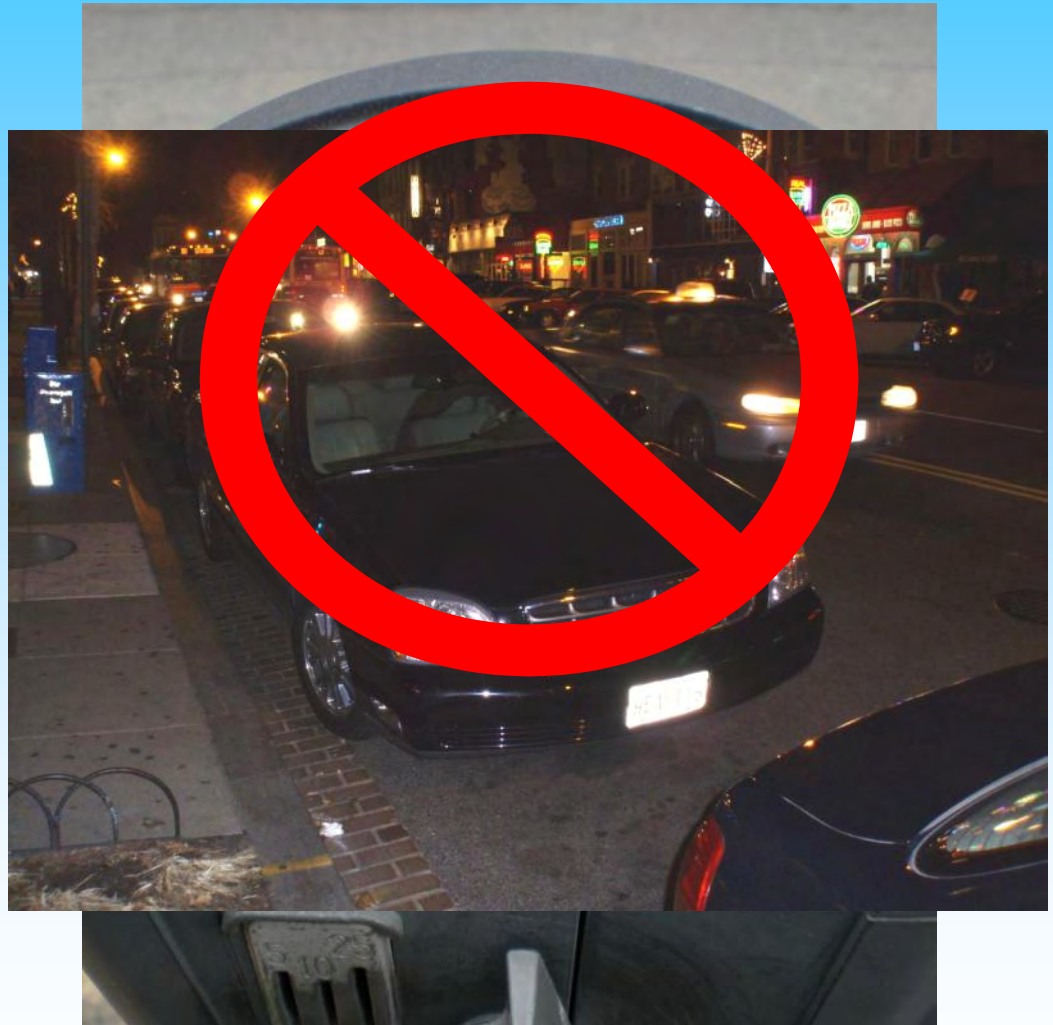


- Building more spaces cannot solve the on-street shortage



1. Supply Management: Curb management strategies

- Eliminate ALL time limits
 - Use pricing to force turn-over
- Vary pricing by block to encourage enough turn-over to keep all blocks 10-15% free
 - Parking can be free at times of low demand
 - Monitor and adjust rates at least quarterly
- Extend meter hours through dining hours (at least 10pm)



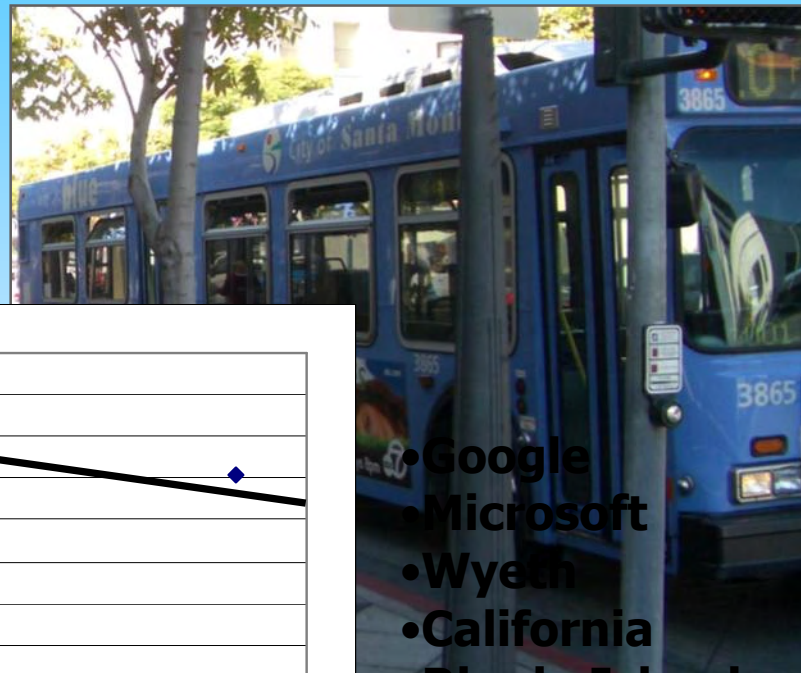
Davis Square on the Busiest Night



2. Parking Demand Management

Reduce parking demand and vehicle trips by providing incentives to use other modes:

- Universal transit passes
- Parking cash-out



- Google
- Microsoft
- Wyeth
- California
- Rhode Island

ca, NY
over, NH
idence, RI

Parking Demand Management

Reduce parking demand and vehicle trips by providing incentives to use other modes:

- Universal transit passes
- Parking cash-out
- Carsharing
- Create Transportation Management Associations
- “Unbundle” parking from development



- Seaport TMA
- Charles River TMA
- ZipCar
- 128 Business Council
- Ithaca Car Share
- Philly Car Share

TDM: Unbundle parking costs

- Parking spaces are sold or leased separately from residence (“unbundled”)
- Reduces cost of housing and commercial space

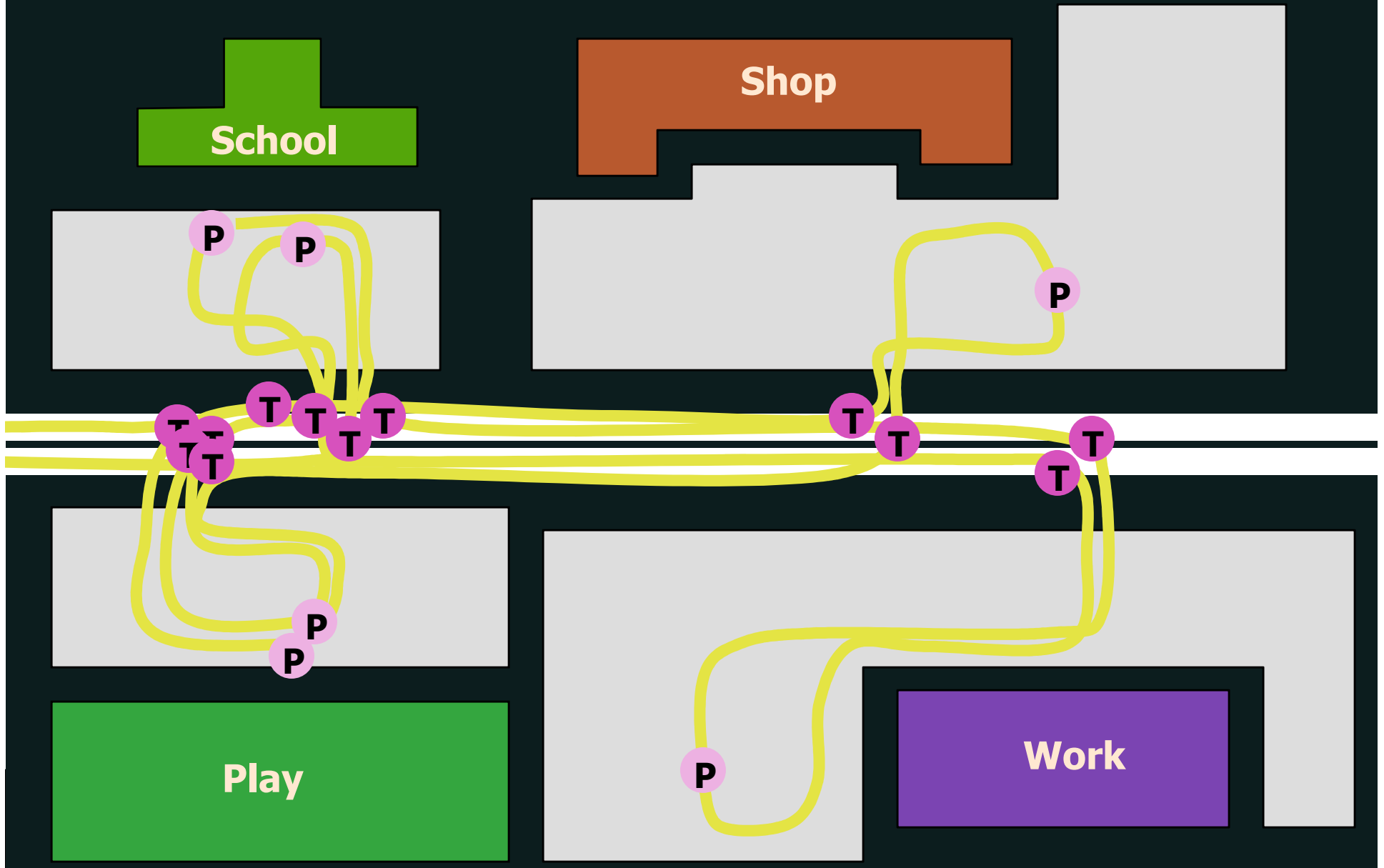


Gaia Building, Berkeley

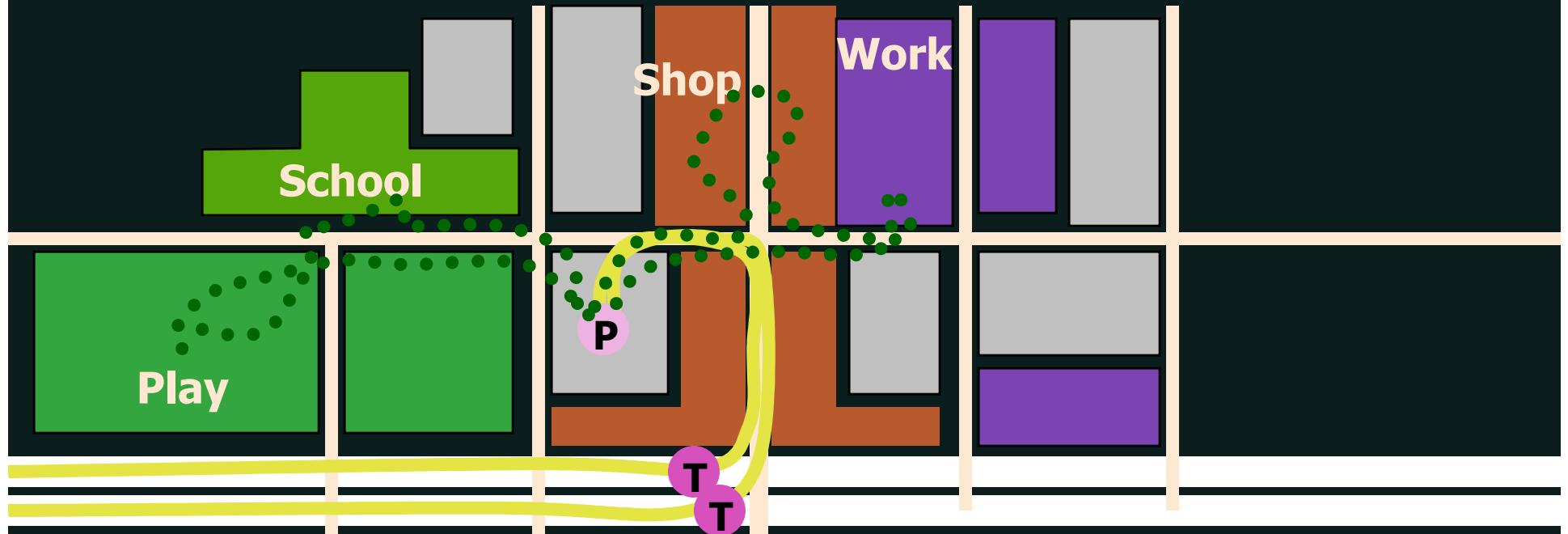
- 91 apartments, theater, café & office space
- 42 parking spaces supplied
- Result: 237 adult residents with just 20 cars



Conventional Development



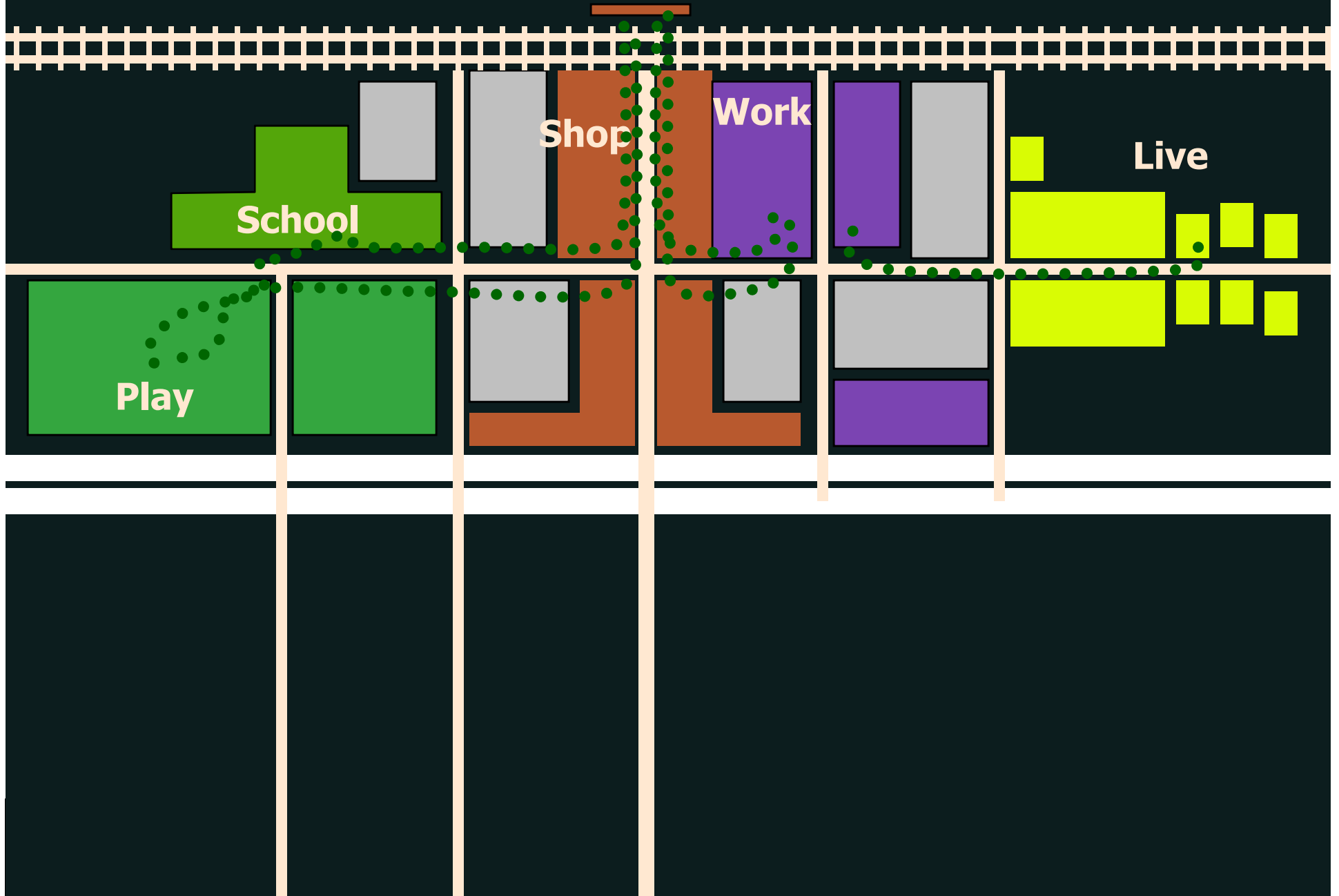
Mixed Use, Shared Parking, Park Once District



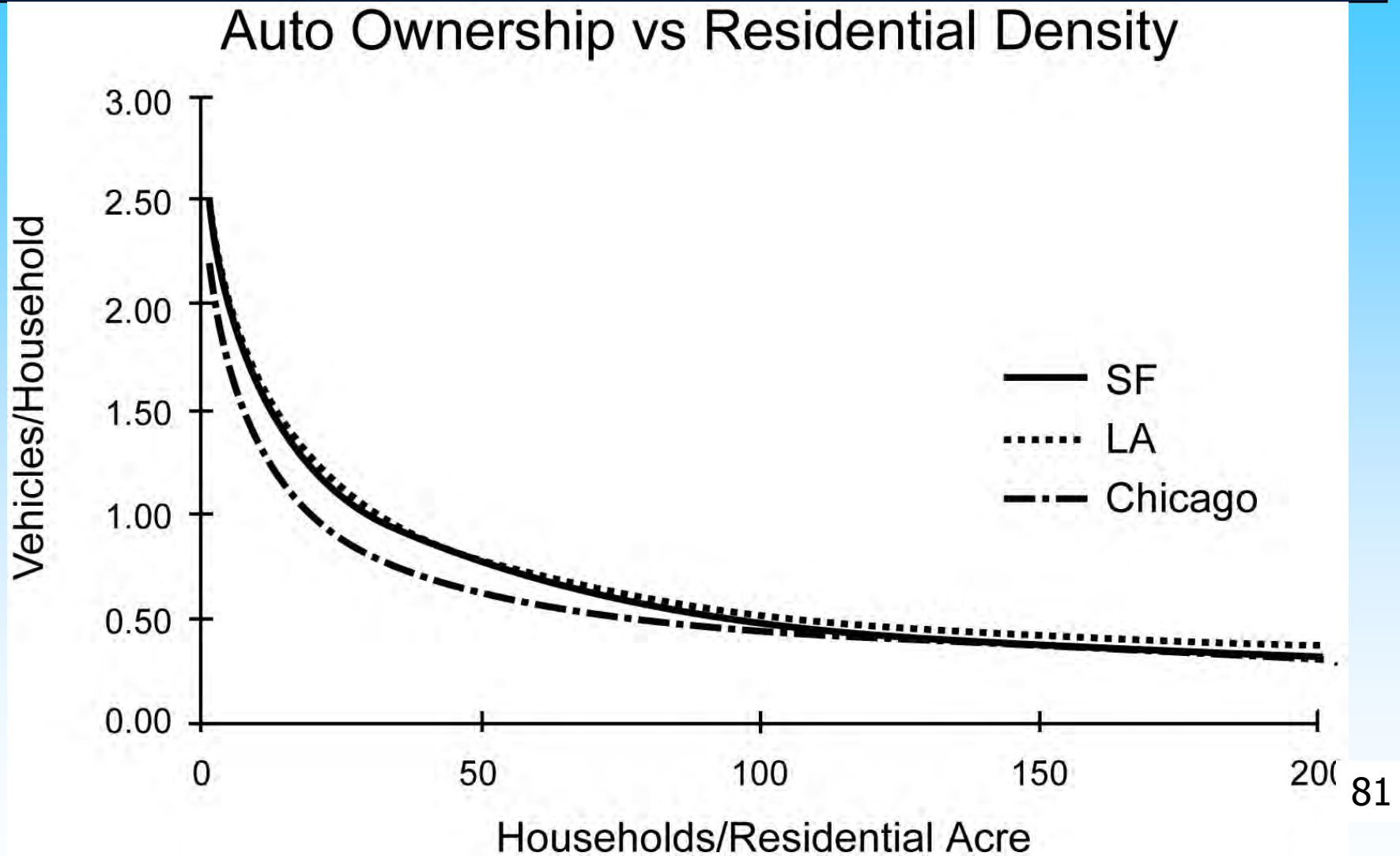
Results:

- $< \frac{1}{2}$ the parking
- $< \frac{1}{2}$ the land area
- $\frac{1}{4}$ the arterial trips
- $\frac{1}{6}^{\text{th}}$ the arterial turning movements
- $< \frac{1}{4}$ the vehicle miles traveled

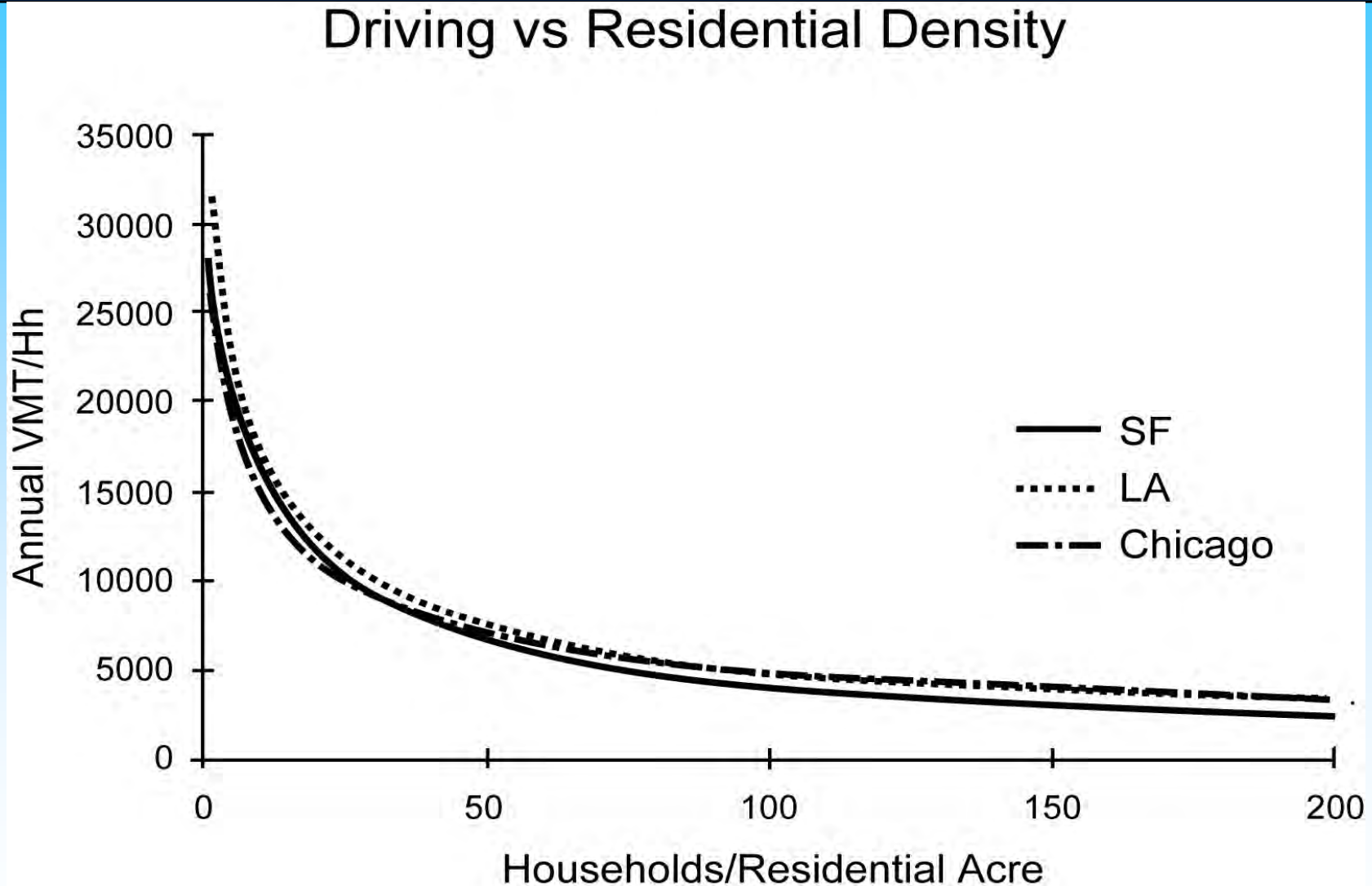
Transit Oriented Development



How land-use affects travel demand



How land-use affects travel demand



Get Parking Right

1. If you build the parking, they will come
 - Stop relying on parking requirements in zoning
2. Treat parking as a system
 - We all seek to park cheaply and conveniently – not where we're "supposed" to park
3. If you manage the on-street "externality" of parking, you don't need parking requirements
 - Institute maximums
 - Remove minimums
4. Use zoning to:
 - Free-up the market to share existing resources
 - Shared-parking; Assuming private liability
 - Control demand
 - Unbundle residential parking; Cash-out employee parking; Integrate car-sharing, TMAs, etc.

For More Information

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